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DATE: November 15, 2017

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SUB: Review Appendix C, Parcel B Evaluation Forms, of Draft Radiological Data Evaluation Findings Report For Parcels B and G Soil, Former Hunters Point Naval Shipyard, San Francisco, CA. Dated September 29, 2017.

As submitted by the California Department of Toxic Substances Control (DTSC), Environmental Management Branch (EMB) of the California Department of Public Health (CDPH) reviewed the, *Appendix C, Parcel B Evaluation Forms, of Draft Radiological Data Evaluation Findings Report For Parcels B and G Soil, Former Hunters Point Naval Shipyard, San Francisco, CA. Dated September 29, 2017.*

DTSC requested EMB to review following Parcel B Current and Former Building Site survey units: Building 114 Site (S0001, S0002), Building 130 (S0008, S0017), Building 142 Site (S0001, S0002, S0003) and Building 157 Site (S0005, S0007). This review was performed in support of the Interagency Agreement between DTSC and CDPH.

If you need further assistance please contact Tracy Jue of my staff at (916) 324-4804 or via email at Tracy.Jue@cdph.ca.gov.



Activity: Review *Appendix C, Parcel B Evaluation Forms*, of *Draft Radiological Data Evaluation Findings Report For Parcels B and G Soil*, Former Hunters Point Naval Shipyard, San Francisco, CA. Dated September 29, 2017.

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The Environmental Management Branch (EMB) of the California Department of Public Health (CDPH) appreciates the opportunity to review the submitted document, *Review Appendix C, Parcel B Evaluation Forms*, of *Draft Radiological Data Evaluation Findings Report for Parcels B and G Soil*, Former Hunters Point Naval Shipyard, San Francisco, CA. Dated September 29, 2017.

Specific Comments:

1. Parcel B Unit Former Building 114 Site (S0002) page 1, Logic Test 6: Observation: states, "Offsite lab samples for Sr-90 have 4 to 5 times the mass of the onsite gamma spec samples". Explain why the offsite lab samples, required 4 to 5 times the mass of the onsite gamma spec samples for Sr-90?
2. Parcel B Building 130 (S0008) page 3 of 8, Gamma Static Data Observations: states, "The data package for SU-008 in the FSSR reports 340 static gamma measurements ranged from -1,033 net gamma cpm to 1096 net gamma cpm, with mean value -192 and standard deviation 487. The gamma background was 6,899 cpm and the 3-sigma investigation level was 6,899 cpm. No measurements exceeded the investigation level. The investigation level was 4.2 standard deviations above the mean". Explain why, the Navy determined the investigation level as 4.2 standard deviations above the mean?
3. Parcel B Building 130 (S0017) page 3 of 8, Gamma Static Data Observations: states, "The data package for SU-017 in the FSSR reports 250 static gamma measurements ranging from -928 net gamma cpm to 1,807 net gamma cpm, with mean value -241 and standard deviation 447. The gamma background was 6,899 cpm and the sigma investigation level was 9,160 cpm. No measurements exceeded the investigation level. The investigation level was 4.5 sigma values above the mean." Explain why, the Navy determined the investigation level as 4.5 sigma values above the mean?
4. Parcel B Former Building 142 SU 1 and 2: Explain why FSS systematic samples for both SUs collected on the same date (2/7/2006)?
5. Parcel B Former Building 142 SU 1 and 2: Explain why both survey units had the same FSS samples 14 of 16 analyzed within 3 working days and two FSS samples analyzed within 1 working day?

Building Site	Trench Unit	Box Plots	Q-Q Plots	Rounds of excavation	Gamma scan or static concerns	On vs offsite lab	Time Series	Suspect name (1=yes, 0=no)
114	SU 1	NA	NA	0 rounds of excavation, no bias samples collected	The gamma static data are consistent with the scan data and the reference area dataset. The gamma scan data is consistent with the static data and the reference area dataset.	Offsite lab samples for Sr-90 have 4 to 5 times the mass compared to the onsite lab. 34 available isotopes comparisons between onsite and offsite data 5 had differences greater than a factor of ten. However, all of these values near zero. FSS samples were collected from 05/26/2005 to 06/14/2005, however samples were counted between 05/01/2007 and 05/03/2007.	NA	0
114	SU 2	NA	NA	0 rounds of excavation, no bias samples collected	The gamma static data are consistent with the scan data and the reference area dataset. The gamma scan data is consistent with the static data and the reference area dataset.	The samples that were sent to the offsite lab for Sr-90 analysis have larger mass than the samples that were processed onsite. FSS samples were collected from 05/26/2005 to 06/14/2005. Samples were counted between 05/01/2007 and 05/03/2007.	NA	0
130	SU 8	NA	NA	0 rounds of excavation, no bias samples collected	Gamma Scan Data not provided in FSSR. The data package for SU-008 in the FSSR reports 340 static gamma measurements ranging from -1,033 net gamma cpm to 1,096 net gamma cpm, with mean value -192 and standard deviation 487. The gamma background was 6,899 cpm and the 3-sigma investigation level was 6,899 cpm. No measurements exceeded the investigation level.	Samples 1-20 were collected on 01/14/2009. Sample 1-9 were counted on 01/14/2009 (same working day), and samples 10-20 were counted on 01/15/2009 (after 1 working day). Two field duplicate (#5 & #10) samples were counted on 09/23/2009.	NA	0
130	SU 17	NA	NA	0 rounds of excavation, no bias samples collected	Gamma Scan Data not provided in FSS. The data package for SU-017 in the FSSR reports 250 static gamma measurements ranging from -928 net gamma cpm to 1,807 net gamma cpm, with mean value -241 and standard deviation 447. The gamma background was 6,899 cpm and the 3-sigma investigation level was 9,160 cpm. No measurements exceeded the investigation level. The investigation level was 4.5 sigma values above the mean.	Samples 1-20 were collected on 01/14/2009. Sample 1-19 were counted on 01/19/2009 (after 3 working days), and sample 20 was counted on 01/20/2009 (after 4 working days). Two field duplicate (#1 and #9) samples were counted on 09/23/2009. The data is consistent for K-40 and Bi-214. The results for Ac-228 are approximately double.	NA	0
142	SU 1	NA	NA	Characterization and final systematic samples collected in Survey Units 1 and 2 are representative of two different soils, separated by what was defined in the FSSR as a second subsurface structure. Characterization samples were collected from above the subsurface structure, and final systematic samples were collected below the subsurface structure, where the FSSR identified the original footprint was located.	One-minute static counts collected at each of the 16 systematic locations on 02/08/2007 by J. Hubbard. Gamma static counts ranged between 2,135 and 4,806 counts per minute (cpm). "Characterization" gamma scan (100% coverage) performed on 09/06/2006 (the day after sampling) by J. Hubbard. Range was between 2,000 and 6,000 cpm - less than the investigation level of 6,092 cpm. Background rate was 5,400 cpm. "Final Status" gamma scan performed 02/08/2007 (the day after sampling) by J. Hubbard. Range was between 4,900 and 6,000 cpm - less than the background +3 sigma (o) investigation level of 6,581 cpm. Background rate was 5,100 cpm.	All Final Systematic samples were collected on 02/07/2007. FSS samples were collected after confirmatory/biased samples which were collected on 09/05/2006. Most FSS samples (14 of 16) were analyzed within 3 working days; the other two FSS samples were analyzed within 1 working day. Onsite and offsite data were consistent.	One FSS sample had a near-zero result for Bi-214, sample 6PB142SU1-22. There was also two negative Ac-228 FSS results (6PB142SU1-018 and 6PB142SU1-025).	1
142	SU 2	K-40 Characterization and FSS box plot differ markedly; mean characterization activity is abnormally low (1.68 pCi/g) vs. FSS mean activity (7.94 pCi/g).	NA	Characterization and final systematic samples collected in Survey Units 1 and 2 are representative of two different soils, separated by what was defined in the FSSR as a second subsurface structure. Characterization samples were collected from above the subsurface structure, and final systematic samples were collected below the subsurface structure, where the FSSR identified the original footprint was located.	One-minute static counts collected at each of the 16 systematic locations on 02/08/2007 by J. Hubbard. Gamma static counts ranged between 2,535 and 4,607 counts per minute (cpm). "Characterization" gamma scan (100% coverage) performed 09/06/2006 (the day after sampling) by J. Hubbard. Range was between 2,000 and 6,000 cpm - less than the investigation level of 6,092 cpm. Background rate was 5,400 cpm. "Final Status" gamma scan performed 02/08/2007 (the day after sampling) by J. Hubbard. Range was between 4,900 and 6,000 cpm - less than background +3 sigma (o) investigation level of 6,581 cpm. Background rate was 5,100 cpm.	All Final Systematic samples were collected on 02/07/2007. FSS samples were collected after confirmatory/biased samples which were collected on 09/05/2006. Most FSS samples (14 of 16) were analyzed within 3 working days; the other two FSS samples were analyzed within 1 working day. Onsite and offsite Data were consistent.	One FSS sample had a near-zero result for Bi-214, sample 6PB142SU2-018. The Pb-214 result was positive at 0.23 pCi/g, but the Ra-226 result was also negative. This occurrence does not indicate potential data falsification. There was also one negative Ac-228 FSS result. For sample 6PB142SU2-019, other thorium-series nuclide results were positive, 0.13 pCi/g for Pb-212 and 0.11 pCi/g for Tl-208, but Bi-212 activity was also negative.	1

142	SU 3	NA	NA	<p>Characterization and final systematic samples collected in Survey Units 1 and 2 are representative of two different soils, separated by what was defined in the FSSR as a second subsurface structure. Characterization samples were collected from above the subsurface structure, and final systematic samples were collected below the subsurface structure, where the FSSR identified the original building footprint was located.</p>	<p>"Characterization" gamma scan (100% coverage) performed 09/06/2006 (the day after sampling) by J. Hubbard. Range was between 2,000 and 6,000 cpm - less than the investigation level of 6,092 cpm.</p> <p>Background rate was 5,400 cpm.</p> <p>"Final Status" gamma scan performed 02/08/2007 (the day after sampling) by J. Hubbard. Range was between 4,900 and 6,000 cpm - less than the background +3 sigma (σ) investigation level of 6,581 cpm. Background rate was 5,100 cpm. One-minute static counts collected at each of the 22 systematic locations on 02/08/2007 by J. Hubbard. Gamma static counts ranged between 3,034 and 5,841 counts per minute (cpm).</p>	<p>Most FSS samples (20 of 22) were analyzed within 3 working days; the other two FSS samples were analyzed within 1 working day. Onsite and Offsite data were consistent.</p>	<p>Two FSS samples had zero (0 pCi/g) results for Bi-214, samples 6PB142SU3-024 and 6PB142SU3-025. For sample 6PB142SU3-024, other radium-series results were mixed; the Pb-214 result was 0.39 pCi/g, however the Ra-226 result was negative at -0.44 pCi/g. For sample 6PB142SU3-025, other radium-series nuclide results were also mixed; the Pb-214 result was 0.30 pCi/g, however the Ra-226 result was negative at -0.50 pCi/g.</p>	1
157	SU 5	NA	<p>Final Systematic samples indicate the potential for at least two different data populations for Bi-214 and K-40.</p>	<p>several rounds of soil excavated. SU-5 had 20 FSS Samples, 6 remedial action biased samples, and 20 systematic characterization samples collected.</p>	<p>Scan measurements were taken on 01/06/2010, with 700 total readings taken. None of the reading exceeded an investigation level (3 sigma, based on a background area average). Static measurements were taken on three different dates - 01/06/2010, 01/29/2010, and 3/04/2010. No measurements exceeded the investigation level (3 sigma). The scan measurements do show correlation to the static measurements.</p>	<p>Data for comparison is limited since only two samples were sent to the offsite laboratory for analysis.</p>	<p>Four out of 20 gamma spec reports for FSS samples had deviation between sample count date and report date.</p>	0
157	SU 7	NA	<p>Final Systematic samples indicate the potential for at least two different data populations for Bi-214 and K-40.</p>	<p>0 rounds of excavation, no bias samples collected</p>	<p>Scan measurements were taken on 03/11/2010, with 1,631 total readings taken. None of the reading exceeded an investigation level (3 sigma, based on a background area average). Static measurements were taken on 03/11/2010 at each sampling location associated with the FSS samples, resulting in 19 measurements. No measurements exceeded the investigation level (3 sigma).</p>	<p>Data for comparison is limited.</p>	<p>NA</p>	NA